MAR 1952 51-4C

CLASSIFICATION CONFIDENTIAL
SECURITY INFORMATION
CENTRAL INTELLIGENCE AGENCY
INFORMATION FROM
FOREIGN DOCUMENTS OR RADIO BROADCASTS

REPORT
CD NO.

50X1-HUM

COUNTRY USSR

SUBJECT Economic; Technological - Machine tools, metal saving

HOW PUBLISHED Monthly periodical and daily newspapers

WHERE PUBLISHED USSR

DATE PUBLISHED Nov 1952 - 26 Feb 1953

LANGUAGE Russian

DATE OF INFORMATION 1952 - 1953

DATE DIST. 7 Jul 1953

NO. OF PAGES 6

SUPPLEMENT TO REPORT NO.

THIS IS UNEVALUATED INFORMATION

SOURCE Periodical and newspapers as indicated.

NEW TRENDS AND METHODS IN USSR FOR SAVING METAL

INTRODUCE NEW EQUIPMENT, IMPROVE DESIGNS -- Moscow, Za Ekonomiyu Materialov, Nov 52

/The author of the following article is D. Ryzhkov, Deputy Minister of Machine Tool Building./

In the drive to save metal, the machine-tool-building industry can concentrate its efforts in two basic directions. First, it can effect a saving in metal by the development and introduction of equipment for various branches of the national economy which will assure the most effective utilization of metals; and second, it can take measures to save metal at its own plants.

In the first instance, the Ministry of Machine Tool Building is uniting a number of branches producing metalworking equipment and tools. This equipment includes presses and forging machines, foundry equipment, metal-cutting machine tools, tools, abrasives, etc. For purposes of saving metal, machine-tool-building plants are giving special attention to perfecting the design and production methods of metalworking equipment (presses and forging, foundry, and other machinery) the adoption of which by various branches of the national economy will assure a considerable increase in the coefficient of metal utilization and a decrease in its expenditure.

I will not attempt to enumerate all types of new equipment being produced or being planned for production at the ministry's plants. I will present certain data merely to illustrate the role of new types of equipment in regard to saving materials.

The production of improved press and forging equipment is of great importance. In this respect, from the viewpoint of saving metal, the basic task of the Ministry of Machine Tool Building is the development of equipment which will either obviate subsequent machining of the items produced or bring it to a minimum.

CLASSIFICATION CONFIDENTIAL

STATE	X	NAVY	X	NSRB		DISTRIBUTION											
ARMY	X	AIR	X	FBI													

Among such machines which have been developed by the Ministry of Machine Tool Building is a group of cold upsetting automatics for the production of bolts 6, 8, 10, 12, and 16 millimeters in diameter; a group of cold upsetting automatics for the production of nuts 8, 12, 16, and 25 millimeters in diameter; automatics for the manufacture of railroad anticreepers, cotters, shock absorbers, etc.

In recent years, machine-tool-building plants have perfected a total of 137 type sizes of presses and forging machines whose use in industry is effecting considerable savings in metal. For example, the utilization in industry of four Model A301 automatics for the manufacture of spring anticreepers is saving more than 7,000 tons of high-quality spring steel per year.

The introduction of new, powerful Model A415 cold upsetting nut automatics for 25-millimeter nuts is saving 1,000 tons of metal per year as compared with the conventional method of manufacturing nuts from bar (polosa) by the hot method. Thread-rolling automatics are also saving a great deal of metal as compared with thread-cutting machine tools.

At present, the Ministry of Machine Tool Building is manufacturing cold upsetting and thread rolling automatics as well as perfecting automatic transfer machine lines for the production of metalware.

The latest development of an advanced technique at plants of the ministry is an automatic transfer machine line for the production of pitch and anchor chains, size 19-40 millimeters. In the production of chains on the automatic line, the metal waste amounts to only 20-24 percent as compared with 30-32 percent on nonautomatic equipment.

Although the effectiveness of introducing press and forging equipment is obvious, the production base for this type of equipment is still inadequate. It must be expanded and the construction of plants for this purpose must be accelerated.

A great deal of work is being done by plants of the ministry on the perfection of new types of casting machines.

At present, the Ministry of Machine Tool Building is producing five-type sizes of molding machines for flasks from 500 x 400 x 200 millimeters to 1,400 x 1,000 x 400 millimeters in size.

For molding large parts, plants of the Ministry of Machine Tool Building are manufacturing various mobile and stationary sand slingers with a productivity of 8 and 20 cubic meters per hour /respectively/.

The introduction of machines for centrifugal casting of cast-iron pipes 75-150 millimeters in diameter and 4 meters long can effect a large saving in metal.

Soviet machine builders are also developing sand-blowing machines for the manufacture of cores, horizontal centrifugal machines for casting hollow billets from 100 to 3,000 kilograms in weight, single-mold and multimold rotary type machines for chill casting, and other complex foundry equipment.

Pressure casting is a very modern method of saving maximum quantities of nonferrous metals. In pressure casting, the need for machining the castings is either eliminated or brought to a minimum. In using this method, deviation from size is 0.5-0.12 millimeters with minimum wall thickness.

At present, plants of the Ministry of Machine Tool Building are manufacturing three type sizes of machines for pressure casting parts from one to 4 kilograms in weight. Their productivity is from 120 to 125 castings per hour.

The following problem has great significance in the matter of saving nonferrous metal.

In pouring, cleaning, and trimming nonferrous castings, a certain amount of metal spatters or otherwise falls into the sand and debris at the foundry. The burnt sand waste usually contains 2-5 percent metal. To recover this metal is an important assignment. Adequate utilization of this metal has not yet been made.

The most effective methods for extracting metals are dry methods, based on the different electrical conductivity of quartz and metals. The machine-tool-building industry is perfecting four type sizes of electric separators for this purpose.

A year ago, the production base of foundry machine building was transferred from the Ministry of Machine and Instrument Building to the Ministry of Machine Tool Building. This base is still inadequate to meet the growing demands of the national economy.

The Ministry of Machine Tool Building is also giving a great deal of attention to decreasing the consumption of metal at its own plants. The basic trends in this direction at machine-tool-building plants are better laying out of patterns for metal, better utilization of scrap, the introduction of new technological processes, the use of good substitutes, the conversion of production of certain parts from rolling methods to casting, the improvement of designs of items to decrease their weight, etc. As a result of this drive in the past 2 years, the proportion of hot-rolled stock consumed in the Ministry of Machine Tool Building was decreased by 15.8 percent.

Significant results have been achieved by reviewing the technological aspects (technologichnost) of design of a number of machine tools. For example, by improving the technological aspects of parts, the consumption of metal in the manufacture of Model 1M53. vertical lathe at the Krasnodarsk Machine Tool Building Plant was decreased by 505 kilograms or 5 percent of the total weight of the machine tool. In the manufacture of Model 6N82 knee-type milling machines at the Gor'kiy Machine Tool (Milling Machine) Building Plant, a saving of 100 kilograms of hot-rolled ferrous metal per machine tool has been achieved. The consumption of rolled ferrous metals in the production of Model 7A35 sharper at the Chkalov Machine Tool Building Plant has been reduced by 42 kilograms, or 2.3 percent of its total weight.

A considerable saving in sheet bar has also been achieved by the use of carefully worked out charts for laying patterns. For example, the amount of metal in the frame of a micrometer with a measuring range of 600-700 millimeters was reduced from 32.2 to 19.8 kilograms at the Kalibr Plant.

A basic trend in saving cast iron is the extensive introduction of thin-wall and chill-cast castings. For example, as a result of using thin-wall castings, the weight of the Model 1A62 machine tool has been decreased by 90 kilograms, which will effect a yearly saving of 500 tons of cast iron. /This would indicate an annual output of 5,555 Model 1A62 machine tools/

The introduction of chill casting will make it possible not only to decrease the thickness of walls but also to decrease machining allowances which will save up to 50 percent of the metal going into parts converted to chill casting.

A matter of primary importance in the machine-tool-building industry is the development of designs and manufacturing technologies which would reduce the weight of machine tools, presses, and forging machines. Certain designers, however, are not taking full advantage of modern methods of studying and measuring stresses under which machine tool parts and units operate. Designers do not always take into consideration the fact that the mechanical properties of metal are constantly being improved. Whereas, 20 years ago ordinary foundry pig iron had a tensile strength of only 10 kilograms per square millimeter, it now has an ultimate strength of up to 20 kilograms per square millimeter; alloyed cast iron now has an ultimate strength of up to 40 kilograms per square millimeter and even higher.

A number of plants of the Ministry of Machine Tool Building, adopting the example of the Moscow Automobile Plant imeni Stalin, have created a number of complex brigades made up of engineers and Stakhanovites for the purpose of reviewing the designs and manufacturing technology of machine tools, machines, and tools.

At the Kolomna Heavy Machine Tool Building Plant, for example, three complex brigades have reviewed the working drafts of machine tools being produced, and have designated concrete measures for saving metal. One of these measures involves the design of Model LT-2 facing lathe in which the spindle has been made of cast iron instead of steel 45. This substitution saves 125 kilograms of steel and 150 kilograms of bronze.

The complex brigades at the Kolomna Heavy Machine Tool Building Plant have noted that slides now made of steel for vertical lathes can be made of extra strong (overkhprochnyy) cast iron. The execution of this measure will save 950 kilograms of 40 Kh steel in the manufacture of Model 1556.

The complex brigade at the Chimkent Presses and Automatics Plant imeni M. I. Kalinin has also done a great deal of work in this field. The consumption of metal in the manufacture of the Model F-124 press can be decreased by 487 kilograms, and that of Model F-127, by 1,166 kilograms.

At present, complex brigades have been created at 12 plants of the Ministry of Machine Tool Building to serve a similar purpose.

According to preliminary data, consumption norms for 1953 for the Ministry of Machine Tool Building as a whole must be decreased by 7 percent for hot-rolled stock and by 16.5 percent for nonferrous metal. Metal-supply plants can and must play a big role in meeting the new norms for metal consumption.

The successful saving of metal depends to a great extent on the work of the Ministry of Ferrous Metallurgy and its sales organization. According to the existing GOST, ferrous metal stock in sizes from 60 to 130 millimeters is produced in increments of 5 millimeters; and in sizes larger than 130 millimeters, in increments of 10 millimeters. For example, stock is produced in sizes 60, 65, 70, 75 millimeters, etc., up to 130 millimeters, and then in sizes 130, 140, 150 millimeters. In many cases this leads to a loss of a great

ceal of metal in machining at machine-building plants. For example, steel 140 millimeters in size must be ordered to produce a part 132 millimeters in size; consequently, 8 millimeters of metal must be removed during machining.

NEW DESIGNS REDUCE WEIGHT OF UNITS -- Tbilisi, Zarya Vostoka, 4 Feb 53

S. Tumanyan, designer at the Tbilisi Machine Tool Building Plant imeni Kirov, in cooperation with technologists, has reviewed and improved the vise unit on the Model 9V175 coupling threading machine. Changing the design of the unit assures more dependable clamping of the pipe and better manufacturing technology. At the same time, a set of 30 jaws with a total weight of 563 kilograms for clamping pipes of various diameters had been manufactured of expensive alloy steel. This assembly has been replaced by a set of small substitute "slide blocks" having a total weight of about 100 kilograms.

In 1953, pipe cutoff and coupling cutoff machines will be modernized. It is expected that the weight of the machines will be decreased by 10 percent.

Although the series-produced universal screw-cutting lathe was designed some time ago, it has been found that its weight could be decreased by making a lighter motor base plate (podmotornaya plita). The yearly consumption of cast iron could then be decreased by 20 tons.

A decrease of machining allowances for parts has saved 90 kilograms of metal in the manufacture of each Model 914B pipe-threading machine. Plant technologists have discovered that about 8 tons of metal can be saved yearly by decreasing allowances in universal screw-cutting lathes.

SHORTEN PRODUCTION CYCLE -- Moscow, Izvestiya, 10 Feb 53

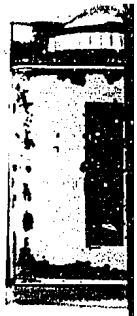
/The author of the following article is D. Polyakov, director, Kramatorsk Heavy Machine Tool Building Plant./

From 200 to 600 calendar days for the manufacture of one heavy machine tool had been considered normal at the Kramatorsk Heavy Machine Tool Building Plant. A large part of this time had been spent in assembling the machine tools.

The stepped-up program as outlined by the 19th Party Congress presented a problem, since the plant had experienced difficulty in the past in meeting considerably smaller assignments. In addition, the program would have to be met without increased floor space or supplementary equipment.

Dozens of complex brigades were created to work out this problem. Special attention was concentrated on shortening the production cycle. Assembly work caused the greatest amount of apprehension, since the assembly shop had been a bottleneck in the past. Each machine tool stood in the assembly shop for 2-3 months or more. Until one machine tool had been completely assembled, inspected, and painted, the assembly of another machine tool could not be started in spite of the fact that the parts for it had been manufactured some time before.

Breaking long-established tradition, radical changes in the technology of assembling heavy machine tools were introduced. Instead of performing assembly operations in successive order, several operations were performed at the same time. This has made it possible for a considerably greater number of workers to participate in the assembly of a machine tool and to accelerate the assembly process.



The application of the new technology has shown tremendous advantages. For example, a stripping (obdirochnyy) machine 60 tons in weight and 18 meters long was assembled in 28 days, whereas it formerly took 58 days. Another advantage of the new method is that workers of the Office of Technical Control can now check each operation and each unit while it is being assembled, rather than after the entire machine tool has been erected.

The production cycle has also been shortened by the adoption of other useful suggestions. For example, hand scraping has been replaced by finish planing with wide cutters. As a result of the many steps taken in this direction, labor consumption for the manufacture of one medium [or average (srednyy)] machine tool has been decreased by 3,000 norm hours.

The persistent effort on the part of plant personnel to shorten the production cycle has produced significant results. In 1952, gross production had increased considerably as compared with 1951, and commodity production had more than doubled. Labor productivity had increased 23 percent, and the cost of manufacturing identical (odinakovyy) machine tools had decreased 30 percent.

The plant program for 1953 has been increased by 40 percent as compared with 1952. As compared with 1952, the plant must put out nearly twice as many heavy-duty machine tools.

In addition to decreasing the production cycle, plant designers and engineers are working on the improvement of design and operating qualities of machine tools, a reduction of their weight, and unification of parts. After reviewing the design of the series-produced Model 1670, the Division of the Chief Designer has decreased its weight by 50 tons. The weight of three other machine tools has been decreased by 5-6 tons.

NEW TECHNOLOGY FOR CIRCULAR SAWS -- Leningradskaya Pravda, 26 Feb 53

In February 1953, the Minsk Tool Plant produced a large batch of welded segments for circular metal-cutting saws. They were welded according to a technology developed by Kreshchanovich, a Stakhanovite at the enterprise. Previously, these parts were made from high-speed steel. Kreshchanovich suggested that only the cutting part be made from high-speed steel, and the other two thirds from ordinary steel. He also developed a special technology for welding the parts of the segment. Welding was done with high-frequency current, with the use of a special powder, the formula for which was developed by Kreshchanovich. Tests showed that welded segments are not inferior in quality to segments manufactured entirely of high-speed steel.

- E N D -